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NOTICE OF ALLOWANCE AND FEE(S) DUE

26694 7590 05/15/2008

VENABLE LLP
P.O. BOX 34385
WASHINGTON, DC 20043-9998

EXAMINER

AHN, SAM K

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 05/15/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/686,814

10/17/2003

Larry W. Fullerton

28549-184882

8790

TITLE OF INVENTION: METHOD AND APPARATUS FOR GENERATING RF WAVEFORMS HAVING AGGREGATE ENERGY WITH DESIRED SPECTRAL CHARACTERISTICS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$720	\$300	\$0	\$1020	08/15/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26694 7590 05/15/2008

VENABLE LLP
P.O. BOX 34385
WASHINGTON, DC 20043-9998

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/686,814 10/17/2003 Larry W. Fullerton 28549-184882 8790

TITLE OF INVENTION: METHOD AND APPARATUS FOR GENERATING RF WAVEFORMS HAVING AGGREGATE ENERGY WITH DESIRED SPECTRAL CHARACTERISTICS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$720 \$300 \$0 \$1020 08/15/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
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AHN, SAM K 2611 375-130000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/686,814	10/17/2003	Larry W. Fullerton	28549-184882	8790
26694	7590	05/15/2008	EXAMINER	
VENABLE LLP P.O. BOX 34385 WASHINGTON, DC 20043-9998			AHN, SAM K	
			ART UNIT	PAPER NUMBER
			2611	
DATE MAILED: 05/15/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 762 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 762 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/686,814

Examiner

SAM K. AHN

Applicant(s)

FULLERTON ET AL.

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 04/16/08.
2. ☒ The allowed claim(s) is/are 19,21-24,36-38,43-46,54,55,73 and 90, renumbered in this office action.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

1. The application has been amended as follows:

Claims 19,21-24,36-38,43-46,54,55,73 and 90 have been renumbered as claims 1-16, respectively.

2. The following is an examiner's statement of reasons for allowance: prior art does not teach

producing a time profile of said desired waveform characterized by a plurality of sample values generating a plurality of RF waveforms, each RF waveform is generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the plurality of RF waveforms are generated in one or more groups, each group of the one or more groups comprising two or more RF waveforms having a predefined time spacing, wherein at least one RF waveform of each group is inverted, wherein the predefined time spacing corresponds to one fourth of the period of a frequency of an eliminated fold image.

producing a time profile of said desired waveform characterized by a plurality of sample values; generating a plurality of RF waveforms, each RF waveform is generated in accordance with a timing of a plurality of samples corresponding to said

plurality of sample values, wherein said plurality of RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time spacing between the plurality of RF waveforms corresponds to the time spacing between the plurality of samples.

producing a time profile of said desired waveform characterized by a plurality of sample values~ generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein said plurality of RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time spacing of the plurality of samples is substantially equal corresponding to a generation rate of the plurality of RF waveforms.

producing a time profile of said desired waveform characterized by a plurality of sample values; generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time profile is in accordance with a shifted average DC level of the desired waveform.

producing a time profile of said desired waveform characterized by a plurality of sample values~ generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time profile of the desired waveform corresponds to a composite profile of a plurality of orthogonal waveforms, wherein the plurality of

orthogonal waveforms have phase shifts in accordance with a plurality of Walsh functions,

producing a time profile of said desired waveform characterized by a plurality of sample values~ generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time profile of the desired waveform corresponds to a composite profile of a plurality of orthogonal waveforms, wherein a first orthogonal waveform of the plurality of orthogonal waveforms is the Hilbert transform of a second orthogonal waveform of the plurality of orthogonal waveforms,

producing a time profile of said desired waveform characterized by a plurality of sample values" generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time profile of the desired waveform corresponds to a composite profile of a plurality of orthogonal waveforms, wherein each orthogonal waveform of the plurality of orthogonal waveforms is an nth order derivative of a first orthogonal waveform of the plurality of orthogonal waveforms,

producing a time profile of said desired waveform characterized by a plurality of sample values~ generating a plurality of RF waveforms, each RF waveforms are generated in accordance with a timing of a plurality of samples corresponding to said plurality of sample values, wherein the time profile is produced by an inverse Fourier transformation of a frequency profile of the desired waveform, wherein the frequency profile is produced by a Fourier transformation of a vector amplitude profile of the

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desired waveform, wherein the vector amplitude profile comprises x, y, z, t, amplitude, and vector polarization angle parameters, wherein x, y, and z correspond to location coordinates, and wherein one or more parameters of said x, y, z, t, amplitude, and vector polarization angle parameters is maintained constant to define at least one of signal amplitude and polarization at one of a point, line, plane, and surface in space over time relative to a position,

generating a plurality of RF waveforms at a waveform generation rate; and modulating the plurality of RF waveforms in accordance with samples of a time profile of a prototype signal to produce an aggregate RF energy that approximates the RF energy of the prototype signal; generating a first plurality of RF waveforms in accordance with corresponding samples of the time profile; and generating a second plurality of RF waveforms in accordance with corresponding samples of the time profile, wherein there is a defined time spacing between each of the second plurality of RF waveforms and a corresponding one of the first plurality of RF waveforms, wherein the defined time spacing corresponds substantially to one fourth of a rate at which both the first plurality of RF waveforms and second plurality of RF waveforms are generated,

a signal generator that generates a plurality of RF waveforms at a waveform generation rate, each of said plurality of RF waveforms having an amplitude scaled in accordance with a desired envelope of a prototype signal; and a filter that limits the aggregate RF energy of the plurality of RF waveforms to within a frequency band of interest, wherein the signal generator includes: a first signal generator that generates a first plurality of RF waveforms having amplitudes modulated in accordance with the

desired envelope; a second signal generator that generates a second plurality of RF waveforms having amplitudes modulated in accordance with the desired envelope, wherein there is a defined time spacing between each of the second plurality of RF waveforms and a corresponding one of the first plurality of RF waveforms, wherein the defined time spacing corresponds substantially to one fourth of a rate at which both the first plurality of RF waveforms and second plurality of RF waveforms are generated (emphasis added).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/686,814
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/Sam K. Ahn/
Primary Examiner, Art Unit 2611

5/15/2008